

IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): A method for detecting an endpoint of a process in a plasma processing system comprising:

- starting said process in a process chamber;
- measuring at least ~~one~~ two endpoint ~~signal~~ signals;
- generating at least two filtered endpoint signals by applying a Savitsky Golay filter to said at least two ~~filtered~~ endpoint signals; and
- determining an endpoint of said process from said at least two filtered endpoint signals,

wherein said at least two filtered endpoint signals comprise a first filtered endpoint signal corresponding to a first chemical constituent found in the process chamber and a second filtered endpoint signal corresponding to a second chemical constituent found in the process chamber,

wherein said endpoint is determined from a ratio signal, said ratio signal generated by a ratio of said first filtered endpoint signal and said second filtered endpoint signal,

wherein the first filtered signal corresponds to a first chemical constituent whose concentration decays during endpoint, and

wherein the second ~~filter~~ filtered signal corresponds to a second chemical constituent whose concentration rises during endpoint.

Claim 2 (Currently Amended): The method as recited in claim 1, wherein said at least ~~one~~ two filtered endpoint ~~signal~~ signals ~~comprises~~ each comprise a smoothed endpoint signal.

Claim 3 (Currently Amended): The method as recited in claim 1, wherein said at least ~~one~~ two filtered endpoint ~~signals~~ signal ~~comprises~~ comprise at least one of a smoothed first derivative of each of said at least ~~one~~ two endpoint ~~signal~~ signals, and a smoothed second derivative of each of said at least ~~one~~ two endpoint ~~signal~~ signals.

Claim 4 (Currently Amended): The method as recited in claim 1, wherein said ~~at least one filtered endpoint signal~~ ratio comprises an endpoint transition.

Claim 5 (Currently Amended): The method as recited in claim 4, wherein said determining said endpoint from said at least ~~one~~ two filtered endpoint ~~signal~~ signals comprises using at least one of a start time of said endpoint transition, an end time of said endpoint transition, and an inflection time of said endpoint transition.

Claim 6 (Currently Amended): The method as recited in claim 1, wherein said at least ~~one~~ two endpoint ~~signal~~ signals ~~comprises an~~ comprise optical ~~signal~~ signals from said plasma processing system.

Claim 7 (Currently Amended): The method as recited in claim 6, wherein said optical ~~signal is~~ signals are related to a spectral irradiance of emitted light from said plasma processing system.

Claim 8 (Currently Amended): The method as recited in claim 6, wherein said optical ~~signal is~~ signals are measured using an optical diagnostic subsystem, said optical diagnostic subsystem comprising at least one of a detector, an optical filter, a grating, a prism, a monochromator, a spectrometer, a CCD array, and a CID array.

Claims 9-10 (Cancelled).

Claim 11 (Currently Amended): The method as recited in claim [[6]] 1, wherein said endpoint is determined from a differential signal, said differential signal comprising at least one of a first derivative, and a second derivative of said ratio signal.

Claim 12 (Original): The method as recited in claim 1, wherein said applying said Savitsky Golay filter comprises setting a filter window width and a polynomial order.

Claim 13 (Currently Amended): A method for detecting an endpoint of a process comprising:

- starting said process in a process chamber;
- measuring a first endpoint signal corresponding to a first chemical constituent found in the process chamber;
- measuring a second endpoint signal corresponding to a second chemical constituent found in the process chamber;
- determining a ratio signal from a ratio of said first endpoint signal and said second endpoint signal, said ratio signal comprises an endpoint transition;
- determining a differential signal from said ratio signal by applying a differential filter to said ratio signal, wherein said differential filter comprises a Savitsky Golay filter; and
- determining an endpoint of said process from said differential signal,

wherein the first filtered signal corresponds to a first chemical constituent whose concentration decays during endpoint, and

wherein the second ~~filter~~ filtered signal corresponds to a second chemical constituent whose concentration rises during endpoint.

Claim 14 (Original): The method as recited in claim 13, wherein said measuring said first endpoint signal further comprises filtering said first endpoint signal, said filtering comprising at least one of a moving average, a finite impulse response filter, and a Savitsky Golay filter.

Claim 15 (Original): The method as recited in claim 14, wherein said measuring said second endpoint signal further comprises filtering said second endpoint signal, said filtering comprising at least one of a moving average, a finite impulse response filter, and a Savitsky Golay filter.

Claim 16 (Currently Amended): The method as recited in claim 13, wherein each of said first endpoint signal and said second endpoint signal comprise ~~an optical signal~~ signals from a plasma process.

Claim 17 (Currently Amended): The method as recited in claim 16, wherein each of said optical ~~signal~~ signals is related to a spectral irradiance of emitted light from said plasma process.

Claim 18 (Currently Amended): The method as recited in claim 16, wherein said optical ~~signal is~~ signals are measured using an optical diagnostic subsystem, said optical diagnostic subsystem comprising at least one of a detector, an optical filter, a grating, a prism, a monochromator, a spectrometer, a CCD array, and a CID array.

Claim 19 (Original): The method as recited in claim 13, wherein said applying said differential filter comprises setting a filter window width and a polynomial order.

Claim 20 (Original): The method as recited in claim 13, wherein said differential signal comprises at least one of a first derivative of said ratio signal and a second derivative of said ratio signal.

Claim 21 (Original): The method as recited in claim 13, wherein said determining said endpoint comprises using at least one of a start time of said endpoint transition, an end time of said endpoint transition, and an inflection time of said endpoint transition.

Claim 22 (Currently Amended): A plasma processing system comprising:  
a process chamber;  
a diagnostic system coupled to said process chamber and configured to measure at least two filtered endpoint signals; and  
a controller coupled to said diagnostic system, configured to filter said at least two filtered endpoint signals using a Savitsky Golay filter, and configured to determine an endpoint from the filtered endpoint signals,

wherein said at least two filtered endpoint signals comprise a first filtered endpoint signal corresponding to a first chemical constituent found in the process chamber and a second filtered endpoint signal corresponding to a second chemical constituent found in the process chamber,

wherein said controller is ~~configure~~ configured to determine said endpoint from a ratio signal, said ratio signal generated by a ratio of said first filtered endpoint signal and said second filtered endpoint signal,

wherein the first filtered signal corresponds to a first chemical constituent whose concentration decays during endpoint, and

wherein the second ~~filter~~ filtered signal corresponds to a second chemical constituent whose concentration rises during endpoint.

Claim 23 (Original): The plasma processing system as recited in claim 22, wherein said diagnostic system comprises an optical diagnostic subsystem.

Claim 24 (Original): The plasma processing system as recited in claim 23, wherein said optical diagnostic subsystem comprises at least one of a detector, an optical filter, a grating, a prism, a monochromator, a spectrometer, a CCD array, and a CID array.

Claim 25 (Currently Amended): The plasma processing system as recited in claim 22, wherein said ~~at least one endpoint signal~~ ratio comprises an endpoint transition.

Claim 26 (Currently Amended): The plasma processing system as recited in claim 25, wherein said controller is further configured to determine said endpoint from said at least ~~one~~ two filtered endpoint ~~signal~~ signals using at least one of a start time of said endpoint transition, an end time of said endpoint transition, and an inflection time of said endpoint transition.

Claims 27-28 (Cancelled).

Claim 29 (Previously Presented): The plasma processing system as recited in claim 22, wherein said controller is configured to determine said endpoint from a differential signal, said differential signal comprising at least one of a first derivative, and a second derivative of said ratio signal.

Claim 30 (Original): The plasma processing system as recited in claim 22, wherein said Savitsky Golay filter comprises a filter window width and a polynomial order.

Claim 31 (Previously Presented): The method as recited in claim 1, wherein the first filtered endpoint signal corresponds to an emission intensity of light at a first wavelength corresponding to the first chemical constituent found in the process chamber, and  
the second filtered endpoint signal corresponds to an emission intensity of light at a second wavelength corresponding to the second chemical constituent found in the process chamber.

Claim 32 (Previously Presented): The method as recited in claim 31, wherein each wavelength is measured using optical emission spectroscopy.

Claim 33 (Cancelled).

Claim 34 (Previously Presented): The method as recited in claim 13, wherein the first filtered endpoint signal corresponds to an emission intensity of light at a first wavelength corresponding to the first chemical constituent found in the process chamber, and

the second filtered endpoint signal corresponds to an emission intensity of light at a second wavelength corresponding to the second chemical constituent found in the process chamber.

Claim 35 (Previously Presented): The method as recited in claim 34, wherein each wavelength is measured using optical emission spectroscopy.

Claim 36 (Cancelled).

Claim 37 (Previously Presented): The system as recited in claim 22, wherein the first filtered endpoint signal corresponds to an emission intensity of light at a first wavelength corresponding to the first chemical constituent found in the process chamber, and

the second filtered endpoint signal corresponds to an emission intensity of light at a second wavelength corresponding to the second chemical constituent found in the process chamber.

Claim 38 (Previously Presented): The system as recited in claim 37, wherein each wavelength is measured using optical emission spectroscopy.

Claim 39 (Cancelled).